

# GEOHERMAL HEATING & COOLING WORKSHOP - TEXAS

## Ground source heat pump solutions



*“Geothermal heat pump systems are the most energy efficient, environmentally friendly, clean and cost-effective space conditioning systems”*

US Environmental Protection Agency

Convened by the: **American Ground Water Trust**

501(c)(3) Education Organization

Register online <http://www.agwt.org/events>

**Tuesday April 7th, 2015 - 8:00am to 4:30pm**

**NORRIS CENTER, Austin • Northcross, 2525 West Anderson Lane, Ste. 365, Austin, TX 78757**

(The Norris Center building is immediately south east of the Northcross Walmart Store)

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Preferred Pump

#### WHAT IT IS ALL ABOUT

Geothermal heating and cooling technology can be applied to virtually all types of space-conditioning, including, office buildings, schools, historic structures, low income housing, hospitals, and ice rinks to name a few examples. This workshop covers new innovations in system design, financing options and regulations that are lowering initial costs and increasing savings during operation.

The program draws on the experience & expertise of industry and agency professionals and will provide a unique opportunity for exchange of information among policy makers involved in energy issues and specialists involved with the design, construction and permitting of ground source geothermal systems for cooling and heating. This one-day program is an incredible opportunity to learn from experienced professionals who are on the forefront of geothermal innovation.

#### Continuing Education Credit

Architect Credits – 7.25 LUS (For HSW) Approved Through the American Inst. of Architects (Provider #G521)

TX Water Well Drillers & Pump Installers – 7.0 CEUs – Course #13445/Provider #1701

TX Air Conditioning and Refrigeration – CEU Approval – Course #13446/Provider #1701

IGSHPA Accredited Installers – 0.75 CEU's

#### WHO SHOULD ATTEND?

This program is geared to home builders, developers of residential and commercial properties and to professionals who design, install, inspect, maintain, approve, recommend or regulate geothermal systems. Geothermal is the technology of choice among those considering “green energy” options for commercial or residential installations.

Energy company engineers, architects, planners & conservation commissioners, building code inspectors, environmental health professionals, home inspectors, water well contractors, HVAC professionals, real estate agents, builders and developers, town officials (Conservation, Zoning, Planning), water testing specialists, etc. should not miss this opportunity to get up to speed with this technology. The technology is changing..... what you knew about geothermal economics and technology a few years ago has likely changed as new equipment and controls have improved efficiency.

**7:15 – 8:00 REGISTRATION**

**8:00 – 8:15 RESOURCE SUSTAINABILITY AND GEOTHERMAL HEATING AND COOLING**

**Andrew Stone**, Executive Director, American Ground Water Trust, Concord, NH

- Water and Energy – The Sustainability Nexus
- Geothermal as a solution to energy generation impacts on the environment
- Design and installation of “outside” geothermal work to ensure groundwater protection

**8:15 – 9:00 GROUND SOURCE HEAT PUMPS - THE FUNDAMENTALS**

**Chuck Hammock, PE, LEED AP, CGD**, Principal, Andrews, Hammock & Powell, Inc, Macon, GA

- Understanding the basic physics of the heat transfer process
- Explanation of terminology (geoexchange, geothermal, ground source, BTUs, tons etc.)
- What happens to the heat transferred underground – where does it go?
- How to measure the efficiency of geothermal systems
- Computer models available for geothermal design

**9:00 – 9:45 DRILLING AND COMPLETING GROUT AND LOOP INSTALLATION IN GEOTHERMAL BORES**

**Benito Gonzalez, Territory Representative, Baroid IDP, Fort Worth, TX**

- Criteria for selecting a drilling contractor for geothermal projects
- Matching the drilling equipment and drilling methods to the geological and site conditions
- Geothermal Design – What geologic data is needed – what is not?
- Installing the vertical loop into the drilled bore – Do’s and Don’ts that cost money
- Grouting material properties and options for geothermal projects
- Techniques of grout placement to meet geothermal design specifications

**9:45 – 10:00 BREAK**

**10:00 – 10:45 ADVANTAGES OF VARIABLE FREQUENCY DRIVE COMPRESSOR GEOTHERMAL HEAT PUMPS**

**Mike Springer, Texas Territory Manager, WaterFurnace International, Southlake, TX**

- How VFD compressor geothermal heat pumps work
- Turbulent flow in loop design: is it necessary to maximize efficiency?
- Reducing the size of a loop field by using VFD GHPs
- Duct Sizing and Layout Considerations- The old rules apply, but with new options
- How VFD GHPs help to balance air flow

**10:45 – 11:30 GEOTHERMAL AT THE WHISPER VALLEY DEVELOPMENT, AUSTIN, TX**

**Dustin Gregoire, Bosch Thermotechnology Corp., Londonderry, NH**

- Whisper Valley: A sustainable community with 7,500 Net-Zero ready homes
- Design of pre-installed geothermal infrastructure for homes
- Geothermal design for 2+ million square feet of retail and office space
- Phase 1: 240 homes connected to EcoSmart Solution program by mid 2015

**11:30 – 12:15 GEOTHERMAL SOURCED BUILDINGS, CITY BLOCKS, AND COMMUNITIES**

**Jay Egg, CMC, President, Egg Geothermal, Tampa, FL**

- Geothermal: a solar charged “thermal battery”
- “Mini-grids” for geothermal energy transfer and load sharing
- Geo Benefits: - Elimination of combustion heating (no CO2)  
- No cooling tower water consumption  
- Storm resilience (no fuel storage or solar infrastructure)
- Case study of geothermal-sourced mini grid

**12:15 – 1:15 LUNCH**

**1:15 – 2:00 AQUIFER THERMAL ENERGY STORAGE – OPEN LOOP DESIGN INNOVATION**

**Chuck Hammock, PE, LEED AP, CGD**, Principal, Andrews, Hammock & Powell, Inc, Macon, GA

- How does Aquifer Thermal Energy Storage (ATES) work? - Fundamentals of design

- Borehole Thermal Energy Storage (BTES) – How does it compare to ATES?
- What are the advantages and disadvantages of ATES over a traditional open loop well design?
- Why are there so many ATES systems in operation in Europe, but uncommon in the United States?
- Case study from the Southeastern United States

**2:00 – 2:45 COMMISSIONING GHP SYSTEMS – ACHIEVING ANTICIPATED PERFORMANCE**

**Don Penn, PE, CGD**, Principal, Image Engineering Group, Grapevine, TX

- How is a GHP HVAC system “Commissioned?”
- Design and Installation Mistakes – Where do they hide?
- What observations and measurements cannot be overlooked?
- Retro-commissioning of existing systems

**2:45- 3:00 BREAK**

**3:00 – 3:45 HYBRID SYSTEMS - INNOVATIVE GHP/GHEX SYSTEM DESIGN**

**Gene Slavens**, Geothermal Development Manager, ClimateMaster, Oklahoma City, OK (invited)

- Advantages of hybrid for summer and winter demands
- Costs and life-cycle benefits
- Tax incentives and cost benefits of hybrid systems
- Case study example of a 750 ton installation
- Design Comparison of GHPs v. Variable Speed compressor Air-to-Air HPs

**3:45 – 4:30 STATUS OF THE GEOTHERMAL INDUSTRY**

**Doug Dougherty**, Executive Director, GEO, Washington DC

- Geographic distribution of geothermal installations
- Trends in the growth of geothermal applications
- Market potential and market predictions for the geothermal industry
- How the Geothermal industry is organized nationally, regionally and locally
- What appear to be the barriers to greater acceptance of geothermal installations?

**4:30 WRAP-UP AND ADJOURN**

**GEOTHERMAL PROGRAM -- REGISTRATION FORM**

Tuesday April 7<sup>th</sup>, 2015 **NORRIS CENTER, Austin • Northcross, 2525 West Anderson Lane, Ste. 365, Austin, TX 78757**

- Registration** \$ 200
- Registration** (AGWT Members, Government) \$ 175
- Registration** (Full-time HVAC/ engineering architect student; ID required) \$ 90
- Download of presentations (post-event)** (\$75 for non-Registrants) \$ 30
- Exhibit Table** (does not include registration) \$ 200

[Walk-in registration (on day of event) \$230] **TOTAL \$ \_\_\_\_\_**

**PAYMENT:**  **Check** [payable to: American Ground Water Trust]

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[www.agwt.org/events](http://www.agwt.org/events)

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Call 800 423-7748 or visit web-site

See web-site for cancellation refund policy

**Return by mail: American Ground Water Trust, 50 Pleasant Street, Concord, NH 03301**

**Return by fax: (603) 228-6557 Call to register (800) 423-7748 Register on line <http://www.agwt.org/events>**